Another facet of indigenous rights is manifested in how indigenous populations attempt to adapt to climate change. This global phenomenon challenges the traditional reciprocity between indigenous peoples and animals with its impacts on biodiversity, cultural diversity, and indigenous observations of animals and environment. Indigenous peoples almost universally use local biodiversity as a buffer against variability, change, and catastrophe in their environment to minimize the risk due to harvest or hunting failure. Adoption of many different crops and varieties that have different susceptibility to droughts and floods traditionally made indigenous survival possible. Indigenous peoples are fighting loss of biodiversity and adapting to climate change through migration, irrigation, water conservation techniques, land reclamation, and changes in hunting and subsistence techniques. For example, in northern Finland among the Sámi, reindeer herding is at the heart of their culture and way of life, although it has been threatened by the increasing unpredictability of winter weather patterns. Sámi herders, in order to retain their human-reindeer relations, are now working to solidify indigenous rights to revitalize land-based traditions through the active participation in indigenous-driven international organizations. Similarly, global indigenous populations attempt to advance the role of traditional knowledge in environmental policy and practice, which contributes to the enhancement of indigenous rights based on historical interactions with animals.

*Chie Sakakibara*

*See also:* Biodiversity; Indigenous Religions, Animals in; Whaling

### Further Reading

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## Institutional Animal Care and Use Committees (IACUCs)

Institutional Animal Care and Use Committee (IACUC) is a term used to describe committees that oversee the use of nonhuman animals in laboratory research in the United States. IACUCs are required at institutions that undertake federally funded laboratory research, like those funded by the National Institutes of Health

(NIH). It is important to understand IACUCs because of their role in governing the lives and deaths of animals in research. For many animals that will spend their entire lives in research labs, IACUC guidelines and practices have real impacts on animals' experience of research protocols and experimentation.

The NIH Office of Laboratory Animal Welfare defines policies for animal welfare in laboratories, which are then instituted by the IACUC (which is overseen by an Institutional Official) at each university. Researchers using animals in their studies must submit a summary of their research protocol to the IACUC for approval. The IACUC also oversees twice-a-year inspections of laboratories where animals are present to ensure adherence to animal welfare policies.

In 1966, the first U.S. federal law was passed protecting animals in laboratory research—the Laboratory Animal Welfare Act, which would later become the Animal Welfare Act (AWA). This passed in a climate of public outcry about the plight of animals in research after a 1966 article, published in *Life* magazine, that described the increasingly commonplace theft of dogs and cats from homes by animal dealers who then sold many of these animals to laboratories. Importantly, the AWA only covers some animal species and excludes rats and mice (the majority of species used in laboratory research), birds, farmed animals, and all cold-blooded animals. Prior to the passage of the AWA, researchers were free to determine on their own what constituted ethical care of animals. Through the second half of the 20th century, regulations and policies related to laboratory animal welfare were repeatedly revised and refined. Passed in 1986, the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals introduced IACUCs as we know them today. This policy is the one to which institutions currently adhere, and it states that all vertebrate animals should be covered under its welfare guidelines.

IACUCs are generally comprised of three to five members (although it is permitted for one person to serve multiple roles on an IACUC, it is not recommended) and require a knowledgeable and senior chair of the committee, a veterinarian with experience in a laboratory setting and with the species being used, a nonaffiliated committee member to offer a noninstitutional point of view, a scientist with experience in animal research, and a nonscientist. Decisions and approvals are passed only if there is a quorum (majority) present and a majority voting in favor of the proposed protocol. IACUC programs involve training and education of committee and program members, researchers, and animal care technicians, in addition to reviewing and approving research protocols and conducting inspections of the institution every six months.

IACUCs ultimately report to the NIH Office of Animal Welfare, but at the institutional level IACUCs are the primary body overseeing research involving animals in university settings, which means that even social science research (and other research outside the laboratory setting) is reviewed by the IACUC. One of the issues with this institutional structure is that IACUCs are generally not trained or

knowledgeable about forms of research involving animals beyond the laboratory. In real terms, this means that IACUC-required trainings for researchers involve teaching them, for instance, the acceptable methods of euthanizing rats, mice, dogs, cats, primates, and other commonly used species at the end of a study. But IACUCs are ill-equipped to oversee more qualitative, ethnographic research on animals—like cows on farms, for example.

As federally mandated programs in institutions that receive federal funding, IACUC-generated information about animals in laboratories is accessible to the public through Freedom of Information Act (FOIA) requests, and IACUC meetings are generally open to the public. This makes the number of animals, the nature of the research, and other specific information about the animals accessible to any member of the public concerned about the welfare—or, more fundamentally, the *use*—of animals in laboratories. To give an example, the Beagle Freedom Project (a nonprofit animal advocacy group dedicated to ending the use of all animals—and particularly dogs and cats—for research) launched a program in 2015 called the Identity Campaign, which solicits members of the public to submit requests for information to IACUCs about a singular animal—a beagle, for instance—in a particular lab, to collect as much information about that animal, and to advocate for their release and adoption at the end of the study.

This kind of external pressure from the public and animal advocacy groups highlights the ongoing debate about the role of animals in laboratory research in which IACUCs are enmeshed. IACUCs were formed as a way to implement greater care and ethical practice related to animal use in laboratory settings, but their presence has not eliminated fundamental ethical questions about how and whether animals should be used in research. In fact, IACUCs at many institutions advocate the Three R's approach—Replacement (of animals with nonanimal or *in vitro* models), Refinement (to reduce the pain and improve well-being of animals), and Reduction (to use fewer animals to obtain the same or equivalent results)—as an indication of a need to move toward less invasive practices, as well as toward an overall reduction in animal use for science.

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*See also:* Multispecies Ethnography; Research and Experimentation; Vivisection

## Further Reading

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## Intelligence

What is intelligence? According to the Merriam-Webster dictionary, intelligence is "the ability to learn or understand things or to deal with new or difficult situations." This general definition captures how the word "intelligence" is normally used. A synonym for intelligence is the word "smart." This definition also focuses on ways in which animals *adapt* to different social and nonsocial environments. Thus, ethologists (scientists who are interested in animal intelligence and who study animal behavior under natural or near-natural conditions) see intelligence as an adaptation that is expressed differently by individual animals, including members of the same species. Applying the renowned ethologist Niko Tinbergen's (1907–1988) ideas about how to further our understanding of intelligence, we need to study the evolution of intelligence, how intelligence allows individuals to adapt to their immediate environments, how individual differences in adapting influence their reproductive success (how many offspring they have who then go on to have offspring of their own), what factors cause various forms of intelligence to evolve, how intelligence develops in individuals, and how and why individual differences emerge.

There are often practical matters associated with the use of the word "intelligence." Some people have argued that less intelligent animals suffer less than more intelligent animals. However, there are no data to support this claim. Also, individuals of supposedly more intelligent species are often claimed to be more valuable and more worthy of protection from harm than individuals of supposedly less intelligent species. Thus, because of these two claims, some conclude that it is more permissible to do things such as conduct physically invasive research on individuals of purportedly less intelligent species.

Recent research has revealed many unexpected results about animal intelligence. For example, it is now known that fish and crocodiles use tools, New Caledonian crows make and use more sophisticated tools than chimpanzees, and birds are able to predict future food resources. Young New Caledonian crows also go to "tool schools" where adults teach them to learn how to make and use tools. It is also known that finches use strict rules of syntax (for humans this refers to how words are arranged to create sentences), great tits (a bird species) learn foraging strategies from other tits and then pass them on to future generations, and fish use what is called "referential" (gestural) communication by nodding their heads in a